

ABSTRACT

An integrated process flow including a plasma step for removing oxide residues following oxygen ashing of a photoresist layer is disclosed. The oxide removal step is effective in preventing micro mask defects and is preferably performed in the same process chamber used for the oxygen ashing step and for a subsequent plasma etch used for pattern transfer. The oxide removal step takes less than 60 seconds and involves a halogen containing plasma that is generated from one or more of NF_3 , Cl_2 , CF_4 , CH_2F_2 , and SF_6 . Optionally, HBr or a fluorocarbon $\text{C}_x\text{F}_y\text{H}_z$ where x and y are integers and z is an integer or is equal to 0 may be used alone or with one of the aforementioned halogen containing gases. The oxide removal step may be incorporated in a variety of applications including a damascene scheme, shallow trench (STI) fabrication, or formation of a gate electrode in a transistor.